Amendments to the Drawings:

The attached drawings include changes to Figures 1-5. These sheets, which include Figures 1-5, replace the original sheets including Figures 1-5.

Attachment: Replacement Sheets

REMARKS/ARGUMENTS

Claims 43, 45, 47, 49-55, 84 and 85 are pending in this application. By this Amendment, claims 43, 45 and 47 are amended and claims 44, 46, 56, 58-60, 83, 86-97, 99-103 are canceled without prejudice or disclaimer. Claims 56, 58-60, 86-97, 99, 102 and 103 are indicated as Canceled in the Final Office Action and Canceled claims 88-97 are amended for typographical informality in the preamble.

Entry of the amended claims is proper under 37 C.F.R. §1.116 since the amendments: (1) place the application in condition for allowance; (2) do not raise any new issues requiring further search and/or consideration; (3) satisfy a requirement of form asserted in the previous Office Action; and/or (4) place the application in better form for appeal, if necessary. Entry is thus requested.

The Patent Office has deemed proper the restriction requirement based on a difference of only 162 patents and published applications between Group I (397 patents and published applications) and Group II (316 patents and published applications). In this age of information technology, the difference between Group I and Group II is minute, and it is respectfully submitted that the search and examination of the entire application could be made without serious burden. Hence, Applicants respectfully request reconsideration, and reserve the right for a petition prior to an appeal, as set forth in 37 C.F.R. §1.144.

The drawings stand objected to based on minor informalities. Although the acronym "S" is standard labeling for steps, the drawings have been amended per Examiner's request. Hence, withdrawal of this objection is respectfully requested.

In the response to arguments, the Patent Office indicates that the Applicants need to reply to a newly cited reference, Park et al. Although the undersigned appreciates the Patent Office's efforts to expedite the prosecution, it is noted that Park et al. was never officially relied upon in a formal rejection. As the Patent Office may be aware, the Patent Office is required to notify the Applicants stating the reasons for a rejection, as required under 35 U.S.C. §132. Although no formal rejection was provided over Park et al., the claims were previously amended for the sole purpose of clarification in view of Patent Office concerns in regard to Park et al. and for the purpose of expediting the prosecution.

The disclosure stands objected to based on informalities, and the Patent Office provides similar reason in the "Response to Arguments." For similar reasons, claims 43-47, 49-55, 83-85, 98, 100 and 101 stand rejected under 35 U.S.C. §112, first paragraph, and likewise, claims 43-47, 49-55, 83-85, 98, 100 and 101 stand rejected under 35 U.S.C. §112, second paragraph. The objections and rejections are respectfully traversed.

The issues repeated from page 3 to page 12 of the Office Action clearly relates to the scope and breath of the claims, and such issues raised in the Office Action have no relevance to the specification objection or indefiniteness under Section 112, second paragraph (just because a

claim is broad does not mean it is indefinite). The Applicants can be their own lexicographer, and the requirement of Section 112, first paragraph, is met if each claim limitation is expressly, implicitly or inherently supported in the originally filed specification.

An embodiment of the specification describes an adaptive encoder encoding information bits at a coding rate which is fixed to a specific value selected among a couple of coding rates in accordance with a ratio of a channel interleaver size (N) and a number of the information bits (I). Based on the ratio, the coding rate can be adapted, modified or changed.

Paragraph [65] in the page 22 of the specification where the 'n', an inverse value of a turbo code rate, is fixed as one selected from {2, 3, 4, 5}. The turbo code rate is fixed according to a ratio between the length 'I' of the input information bitstream of the channel encoder and the channel interleaver size 'N'." In addition, paragraph [69] on page 23 of the specification describes how to change the coding rate according to the ratio of 'N' and 'I'. Particularly, the paragraph [69] reads, "However, since there is a puncturing block in an existing turbo encoder, the puncturing block is used for fixing the code rate....." A turbo encoder has a puncturing block and a coding rate of the encoder can be varied using the puncturing block, for example, by changing puncturing patterns in the puncturing block. Accordingly, a coding rate in an encoder can be changed during transmitting data using a puncturing block in accordance with a ratio of a channel interleaver size and a number of the information bits.

Instead, the Patent Office has used its own interpretation of what the invention should be rather than what the invention is based on the disclosure of the specification. For example, the Patent Office asserts that a fixed rate encoder and the encoding rate is a design feature used to select the particular encoder during the design of the system. Further, the Patent Office indicates "that an adaptive encoder requires either 1) the encoder be made up of several encoders having different rates and a device or control for selecting the particular encoder, 2) the encoder is followed or preceded by an additional rate matching device (a rate matching device in addition to the rate matching device claimed in lines 8-10 of claim 43) or 3) the encoder is rate matched to itself, i.e., it does nothing." Such a statement or conclusion of the invention is clear error since the Patent Office is ignoring the description of the invention described in the specification.

Based on the disclosure of the specification, a coding rate is determined based on the ratio between the length 'I' of the input information bitstream of the channel encoder and the channel interleaver size 'N'. The length 'I' of the input information bitstream of the channel encoder can be varied during data transmission when variable data rates or flexible data rates are used in a communications system. Accordingly, if the coding rate is fixed during the design of the system based on the Patent Office's interpretation of the invention, it is not possible to change the coding rate during data transmission. Obviously, the Patent Office has indicated how the coding rate can be adapted, which may be obvious to one of ordinary skill in the art, but

the specification provides a completely different, e.g., novel and non-obvious, for adapting the coding rate.

However, for the purpose of expediting the prosecution, independent claim 43 has been amended for clarification. The amendments are not intended to concede on the issue of Section 112, first paragraph, and the Applicants reserve its rights to further prosecute previously pending claim 43. Withdrawal of the objections and Section 112, first and second paragraph, rejections is respectfully requested.

Claims 43-45, 84, 85, and 101 stand rejected under 35 U.S.C. §102(b) over Katsuragawa (U.S. Patent No. 5,907,586) (hereinafter "Katsurgawa"). This rejection is respectfully traversed.

Katsuragawa fails to disclose all the claimed features, as required under Section 102. For example, Katsuragawa does not disclose or teach the first step of "encoding information bits by an encoder at a coding rate, the coding rate being fixed to a specific value among at least two different values using a puncturing block in the encoder according to a ratio of a channel interleaver size and a number of the information bits," and the combination thereof, as recited in independent claim 43.

The Patent Office concludes that a convolutional encoder 130 in Fig. 5 of Katsuragawa teaches adapting the prescribed code rate of the encoder and providing coding bits. However, the convolutional encoder in Fig. 5 of Katsuragawa encodes information bits at a fixed coding rate notwithstanding a size of the information bits. The coding rate in Fig. 5 of Katsuragawa is

1/2, which is apparent from the fact that when data rates of the information bits are 9.6kbps, 4.8kbps, 2.4kbps, and 1.2kbps in Fig. 5A of Katsuragawa, data rates of the encoded bits outputted from the convolutional encoder 130 are 19.2ksps, 9.6ksps, 4.8ksps, and 2.4ksps, respectively.

Katsuragawa fails to teach all the elements and features of the independent claim 43. Likewise, Katsuragawa fails to disclose or teach the features and the combination thereof, as recited in dependent claims 45, 84, and 85. Hence withdrawal of this Section 102 rejection is respectfully requested.

Claims 46, 47, 49-55, 83, 98 and 100 stand rejected under 35 U.S.C. §103(a) over Katsuragawa in view of Eroz (U.S. Patent No. 6,370,669). This rejection is respectfully traversed.

As argued above, Katsuragawa fails to disclose all the claimed features, and Eroz fails to teach the deficiencies found in Katsuragawa. Hence, the proposed combination of Katsuragawa and Eroz cannot result in the claimed invention.

Fig. 3 of Eroz depicts a general structure of a turbo encoder. As shown in Fig. 3 of Eroz, a turbo encoder comprises a first constituent encoder, a turbo interleaver, a second constituent encoder, and a puncturing block. Eroz relates to a method and apparatus using a set of rate-compatible Turbo Codes optimized at high code rates and derived from a universal constituent code. Eroz fails to teach the variation of coding rates in an encoder according to a ratio of a

channel interleaver size and a number of the information bits. Namely, Eroz fails to teach an encoder having a coding rate varying during data transmission according to a ratio of a channel interleaver size and a number of the information bits.

The combination of Katsuragawa and Eroz fails to establish a prima facie case of obviousness, as required under Section 103. Hence, withdrawal of this rejection is respectfully requested.

Claims 46, 47, 49-56, 58-60, 83, 87-97, claim 98, and claim 100 stand rejected for the same reasons as the previous Office Action. These rejections are respectfully traversed for the same reasons as the previous reply and/or the proposed combination fails to establish a prima facie case of obviousness as required under Section 103, as set forth above.

CONCLUSION

In view of the foregoing amendments and remarks, it is respectfully submitted that the application is in condition for allowance. Favorable consideration and prompt allowance are earnestly solicited.

If the Examiner believes that any additional changes would place the application in better condition for allowance, the Examiner is invited to contact the undersigned attorney, **Daniel Y.J. Kim**, at the telephone number listed below.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this, concurrent and future replies, including extension of time fees, to Deposit Account 16-0607 and please credit any excess fees to such deposit account.

Respectfully submitted,
FLESHNER & KIM, LLP

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Attachments: Replacement sheets Figures 1-5

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703 766-3701 DYK/dak
Date: April 12, 2006
Please direct all correspondence to Customer Number 34610
Q:\Documents\2016-367\86485.doc

FIG.2

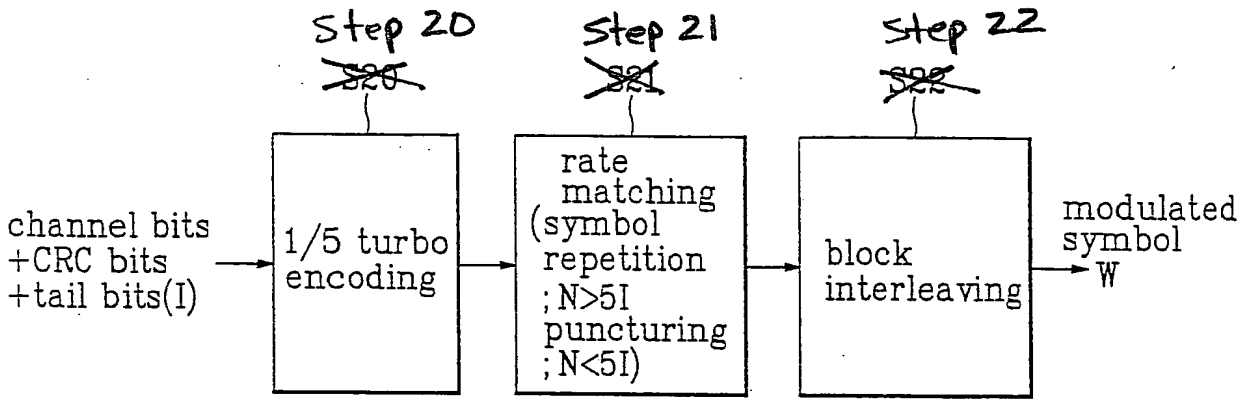
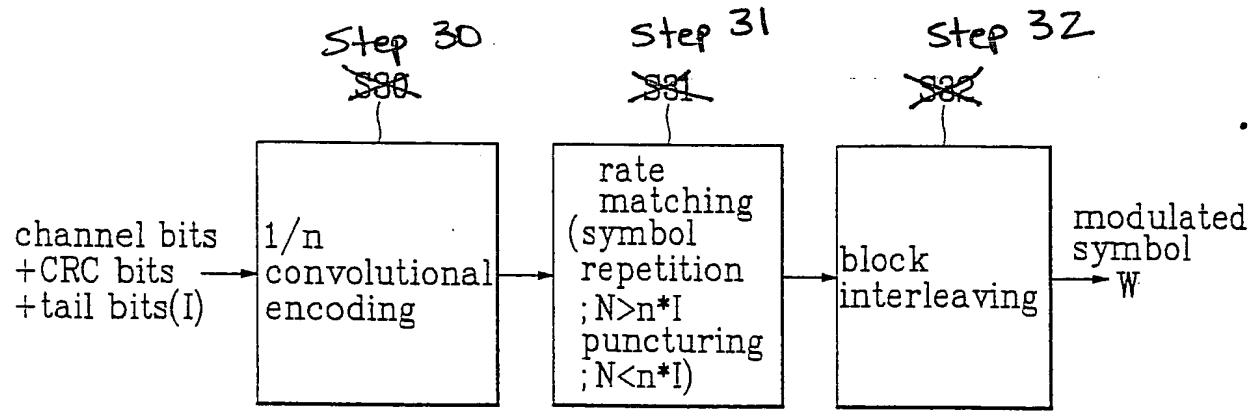


FIG.3



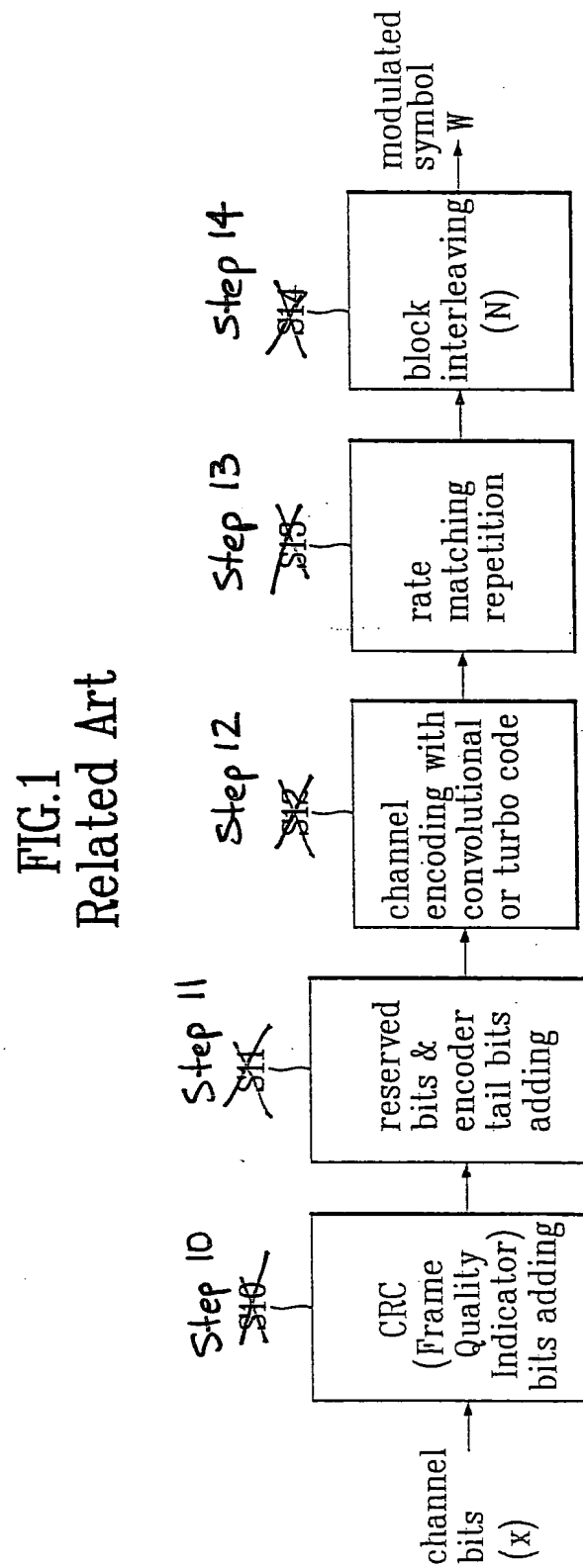


FIG.1
Related Art

FIG. 4

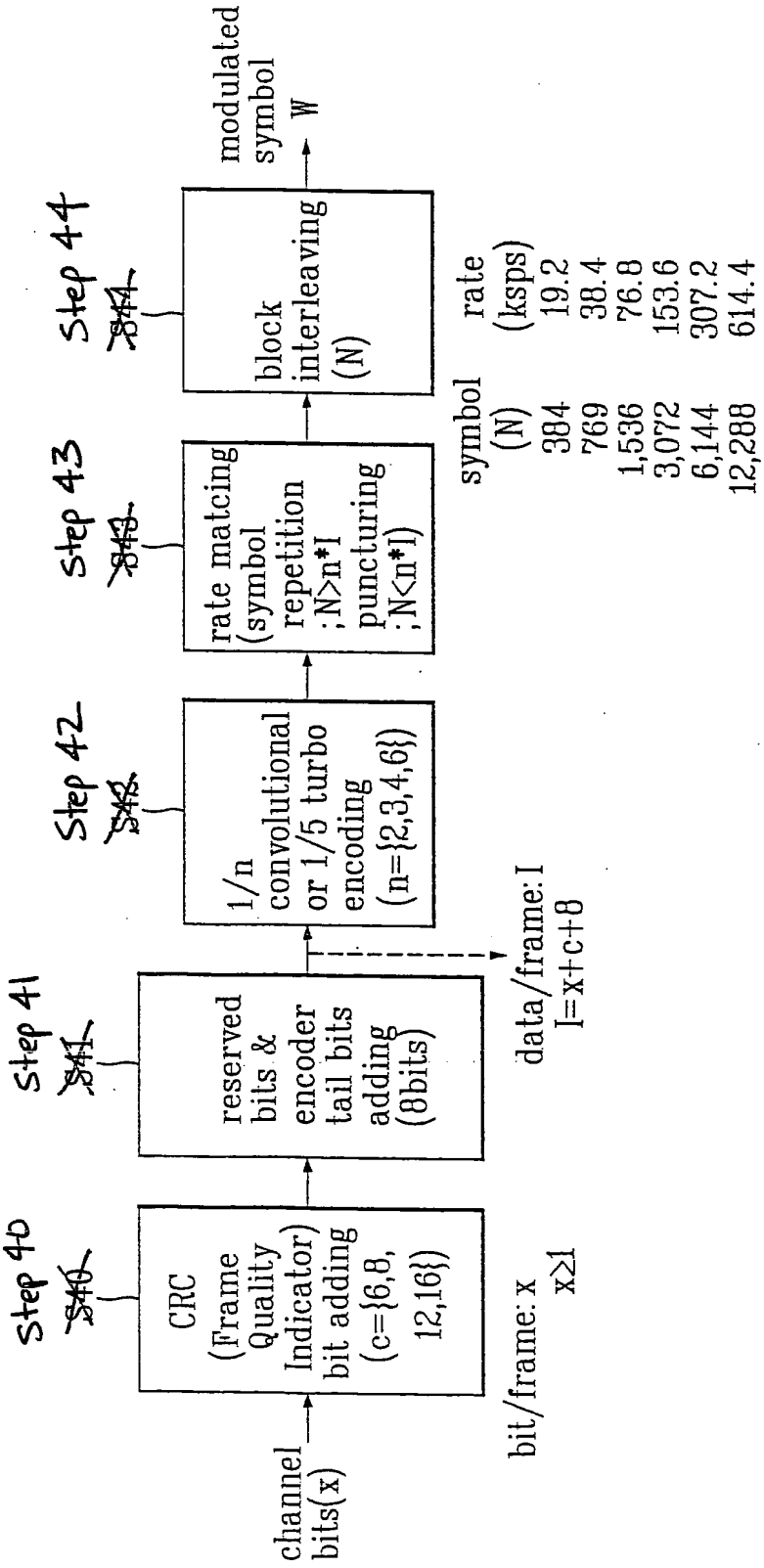
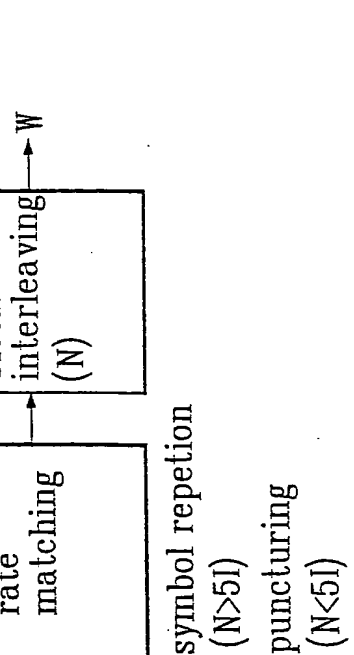

Step 40
S40
CRC (Frame Quality Indicator) bit adding (c={6,8, 12,16})
Step 41
S41
reserved bits & encoder tail bits adding (8bits)
Step 42
S42
1/n convolutional or 1/5 turbo encoding (n={2,3,4,6})
Step 43
S43
rate matcing (symbol repetition ;N>n*I puncturing ;N<n*I)
Step 44
S44
block interleaving (N)
channel bits(x)
bit/frame: x
x≥1
data/frame: I
I=x+c+8
modulated symbol
W
symbol (N)
rate (ksps)
384
19.2
769
38.4
1,536
76.8
3,072
153.6
6,144
307.2
12,288
614.4

FIG.5


channel bits(x)
Step 50
S50
CRC (Frame Quality Indicator) bits adding
Step 51
S51
reserved bits & encoder tail bits adding
Step 52
S52
channel encoding with turbo code (1/n)
n ∈ {2,3,4,5}
Step 53
S53
rate matching
symbol repetion (N>5I)
puncturing (N<5I)
Step 54
S54
block interleaving (N)
modulated symbol
W